INITIAL INVESTIGATION OF SUSPECTED SUBSURFACE PETROLEUM CONTAMINATION

FARRELL / PEPSI BOTTLING
ROUTE 7B
NORTH CLARENDON, VERMONT

(VTDEC SITE #98-2456)
GI#19941469

April 1999

Prepared for

Farrell / Pepsi Bottling Company
P.O. Box 4010
South Burlington, VT 05406

Prepared by

GRIFFIN INTERNATIONAL

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I. INTRODUCTION

This report summarizes the initial investigation of suspected subsurface petroleum contamination at Farrell / Pepsi Bottling (the Site) on Route 7B in North Clarendon, Vermont (see Site Location Map, Appendix A). This work was requested by Mr. Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to Mr. Rick Baker of Louis Farrell, Inc., dated November 17, 1998. This work was performed generally in accordance with the November 30, 1998, *Work Plan and Cost Estimate for a Subsurface Investigation of Suspected Petroleum Contamination* prepared by Griffin. The work plan was approved by Mr. Schwer (VTDEC) in a letter to Mr. Larry Moirano (Louis Farrell, Inc.), dated February 1, 1999.

The Work Plan and Cost Estimate specified collecting groundwater samples from four existing monitoring wells, however during the site visit on February 16, 1999, only one monitoring well was found to still exist.

II. SITE BACKGROUND

A. Site History

On August 10, 1998, petroleum contamination was detected at the Site during soil field screening at the routine closure inspection for one 1,000-gallon capacity diesel underground storage tank (UST) and one 2,000-gallon capacity gasoline UST. The USTs were replaced with one 10,000-gallon capacity split compartment gasoline and diesel UST. Soil samples collected during the UST closure inspection were screened for volatile organic compounds (VOCs) using HNu™ systems Model HW-101 photoionization detector (PID) equipped with a 10.2 eV lamp. Soils collected from the excavation of the USTs had VOC readings up to 120 parts per million (ppm) [2].

As a result of the petroleum contamination detected in the subsurface during the UST closure inspection in August 1998, the VTDEC requested that additional work be conducted at the Site in order to determine the extent and degree of petroleum contamination.

B. Site Description

The Site is located on the west side of Route 7B in North Clarendon, Vermont (see Site Map, Appendix A).

The former USTs were located on the western side of a paved parking area, which is located on the west side of the Site building (see Site Map, Appendix A). The surface topography across the parking lot is relatively level. Beyond the parking area the surface topography gently slopes

down to the south-southwest. The areas west and south of the parking area are wooded with trees and scrub brush. The nearest surface water is an unnamed brook approximately 800 feet southwest of the Site. The brook flows toward the west and discharges into Otter Creek approximately one mile from the Site.

The Site and surrounding area are served by private water. The supply well for the Site is located approximately 200 feet northeast of the former USTs.

C. Site Geology

According to the Surficial Geologic Map of Vermont [3], the Site is underlain by glacial moraine consisting of ice marginal till accumulations with morainic topography. Bedrock below the Site is mapped as the Winooski Dolomite, a buff weathered, pink, buff, and gray dolomite [4].

III. INVESTIGATIVE PROCEDURES

To further define the extent of subsurface petroleum contamination in the area of the former gasoline and diesel USTs, the following investigative tasks were undertaken: groundwater and supply well sample collection and analyses for petroleum related constituents; and a sensitive receptor survey.

A. Groundwater Sampling and Analyses

Griffin collected a groundwater sample from monitoring well MW-1 on February 16, 1999. The groundwater sample was analyzed by Endyne, Inc. of Williston, Vermont, by EPA Method 8021B for the presence of benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertiary butyl ether (MTBE), naphthalene, and the alkylbenzenes: 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene, and by EPA Method 8015-DRO (diesel range organics) for total petroleum hydrocarbons (TPH).

Results of the laboratory analyses for the monitoring well are summarized in Appendix C. The applicable Vermont Groundwater Enforcement Standards (VGES) for each of the compounds are included on the table in Appendix C. The laboratory analysis report is contained in Appendix D. Analytical results of the duplicate and trip blank samples indicate that adequate quality assurance and control were maintained during sample collection and analysis.

MTBE and naphthalene were detected in the groundwater sample collected from MW-1 in concentrations exceeding the VGES for these compounds. MTBE is a gasoline additive for boosting octane. Very low to trace concentrations of benzene, xylenes, and 1,2,4-

trimethylbenzene, below the VGES for these compounds, were also detected in the sample from MW-1.

Prior to collecting the groundwater sample from MW-1 on February 16, 1999, the water table was measured at an approximate depth of 1.9 feet below the top of the well casing. The total depth of the monitoring well was measured at approximately 2.7 feet below the top of the well casing. The liquid level monitoring data is summarized on the table in Appendix B.

Based on the surface topography, the shallow groundwater flow is estimated to be directed generally toward the southwest. Given this estimated groundwater flow direction, monitoring well MW-1 is located in a crossgradient direction from the former USTs with respect to the surficial aquifer.

B. Supply Well Sampling and Analysis

Griffin collected a water sample from the supply well servicing the Farrell / Pepsi Bottling facility on February 16, 1999. The supply well sample was collected from a sink faucet in the handicapped bathroom. Water was run through the faucet for approximately 20 minutes prior to collecting the sample to purge the water that had been sitting in the pipes.

The supply well for the Site is located approximately 200 feet northeast of the former USTs. Based on the estimated groundwater flow direction, the supply well is located upgradient of the former USTs with respect to the surficial aquifer.

The supply well water sample was analyzed by EPA Method 8021B and EPA Method 8015-DRO, as described above for the groundwater sample. The laboratory analysis report is contained in Appendix D. No VOCs were detected by laboratory analysis in the water sample collected from the supply well. No unidentified peaks of petroleum compounds were detected in the supply well sample.

C. Sensitive Receptor Survey

A qualitative risk assessment was conducted to identify known and potential receptors of the contamination detected at the Site. A visual survey was conducted during the site visit on February 16, 1999. Based on these observations, a determination of the potential risk to identified receptors was made.

The soil and groundwater in the vicinity of the former gasoline and diesel USTs are potential receptors of the UST-related contamination.

The nearest surface water is an unnamed brook approximately 800 feet southwest of the Site. The risk to the unnamed brook posed by the petroleum impact in the vicinity of the former USTs

cannot be determined with the currently available data. The risk to the unnamed brook will be reassessed following the installation of the additional monitoring wells (see Recommendation 1 in Section V below).

The risk of impact to the Site supply well is considered minimal since the supply well is located in an estimated upgradient direction from the former USTs with respect to the shallow aquifer and since no VOCs were detected by laboratory analysis in the water sample collected from the supply well on February 16, 1999.

No buildings, indoor air spaces, or other water supplies were identified to be potentially at risk from the detected petroleum contamination at the Site.

IV. CONCLUSIONS

Based on the results of this investigation at Farrell / Pepsi Bottling in North Clarendon, Vermont, Griffin presents the following conclusions:

1) VOC readings of soils collected during the UST closure inspection in August 1998 indicated that adsorbed petroleum compounds existed in the soils in the immediate vicinity of the former gasoline and diesel USTs.

2) Six shallow leak detection wells were identified during the UST closure inspection in August 1998. Two of these wells were known to have been destroyed during the UST closure. During the site visit on February 16, 1999, only one of the four monitoring wells, MW-1, was found to still exist.

3) The depth to groundwater measured on February 16, 1999, in monitoring well MW-1 was approximately 1.9 feet below the top of the well casing. Based on the ground surface topography and the proximity of the unnamed brook, the shallow groundwater flow beneath the Site is estimated to be directed generally toward the southwest.

4) A groundwater sample was collected from monitoring well MW-1 on February 16, 1999. MTBE and naphthalene were detected in concentrations exceeding the VGES for these compounds. Very low to trace concentrations of benzene, xylenes, and 1,2,4-trimethylbenzene, below the VGES for these compounds, were also detected in the sample from MW-1.

5) The presence of MTBE in the groundwater sample collected from MW-1 indicates that a gasoline source has contributed to the detected petroleum contamination at the Site. The source of the detected petroleum contamination is likely due to spills, overfills, and leaks due to usage over time. The duration and volume of product released is unknown. The gasoline and diesel USTs were replaced in August 1998. With the USTs replaced, it is

expected that adsorbed and dissolved petroleum compound concentrations will decrease over time with the progressive action of natural mitigative processes.

6) Other than site soils and groundwater in the direct vicinity of the former gasoline and diesel USTs, there are no known sensitive receptors currently affected by the subsurface petroleum contamination at Farrell / Pepsi Bottling, and none are deemed at significant potential risk, based on currently available data. However the downgradient extent of the petroleum contamination has not been defined.

V. RECOMMENDATIONS

Based on the results of this site investigation, Griffin recommends the following:

1. Since the existing monitoring well, MW-1, is located in an estimated crossgradient direction from the former USTs, Griffin recommends that two additional monitoring wells be installed at the Site to characterized the groundwater flow direction and to determine the degree and extent of petroleum contamination. Suggested locations for the additional monitoring wells are sketched on the Site Map in Appendix E.

2. Approximately one week after the installation of the new monitoring wells, groundwater elevations and samples should be collected from the existing MW-1 and the newly installed MW-2 and MW-3. The collected groundwater samples should be analyzed for VOCs according to EPA Method 8021B.

3. Information regarding the construction of the Site's supply well should be obtained from the VTDEC Water Supply Division offices in Waterbury, Vermont.

REFERENCES

1. USGS 7.5 Minute Topographic Map, Rutland, VT, dated 1961, photorevised 1988.

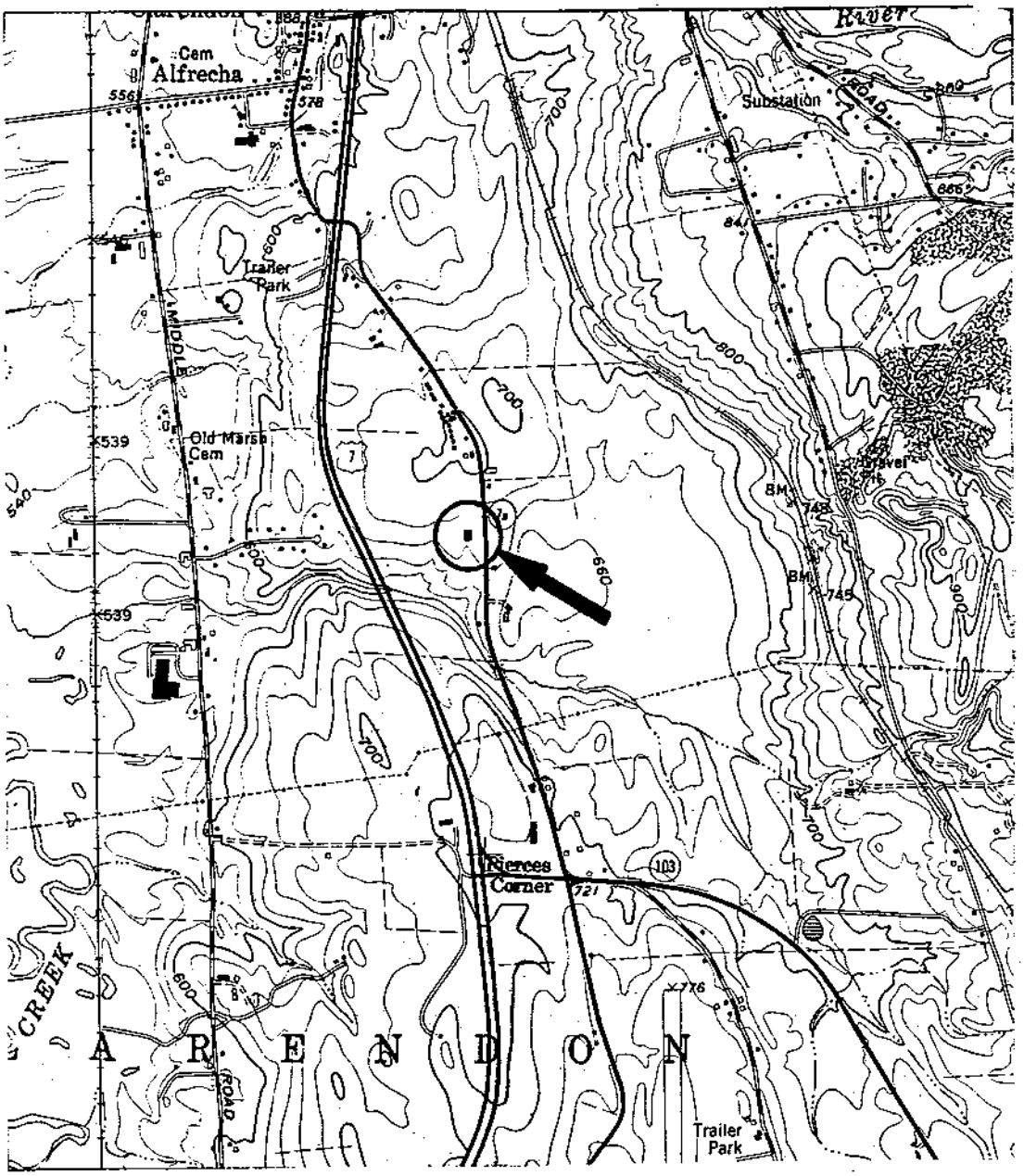
2. Griffin International, August 13, 1998, *UST Closure Inspection, Farrell's Pepsi, North Clarendon,* letter report to Ms. Sue Thayer, State of Vermont, Department of Environmental Conservation.

3. Doll, Charles G., ed., 1970, *Surficial Geologic Map of Vermont*, Vermont Geological Survey.

4. Doll, Charles G., ed., 1961, *Centennial Geologic Map of Vermont*, Vermont Geological Survey.

APPENDIX A

Site Location Map
Site Map



SOURCE: USGS- RUTLAND, VERMONT QUADRANGLE

JOB #: 19941469

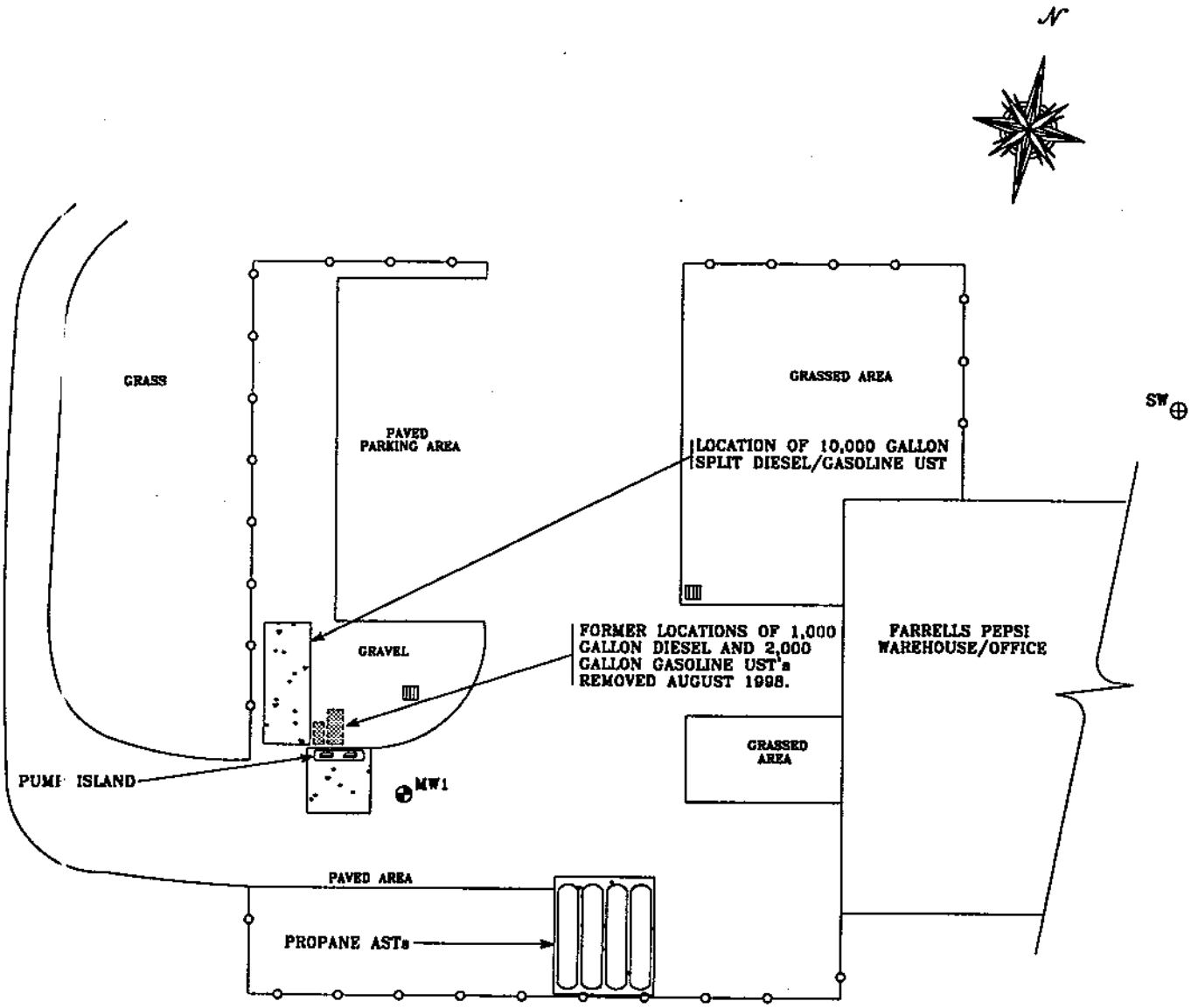
GRIFFIN INTERNATIONAL INC.

FARRELL/PEPSI BOTTLING

PEPSI WAREHOUSE/OFFICE
NORTH CLARENDON, VERMONT

SITE LOCATION MAP

DATE: 2/17/99	DWG.#:1	SCALE: 1:24000	DRN.:SB	APP.:CW



LEGEND

MW1	MONITORING WELL
SW	SUPPLY WELL
	STORM DRAIN
	FENCELINE

JOB #: 19941469

GRIFFIN INTERNATIONAL INC

FARRELL/PEPSI BOTTLING

PEPSI WAREHOUSE/OFFICE
NORTH CLARENDON, VERMONT

SITE MAP

DATE: 2/17/99	DWG.#:2	SCALE: 1"=40'	DRN.:SB	APP.:CW

APPENDIX B

Liquid Level Monitoring Data

LIQUID LEVEL MONITORING DATA

FARRELL / PEPSI BOTTLING
NORTH CLARENDON, VERMONT

2/16/99

Well I.D.	Well Depth bgs	Top of Casing Elevation	Depth To Product btoc	Depth To Water btoc	Product Thickness	Specific Gravity Of Product	Water Equivalent	Corrected Depth To Water	Corrected Water Table Elevation
MW-1	2.74	100.00	-	1.87	-	-	-	-	98.13

All Values Reported in Feet

btoc - Below Top of Casing

bgs - Below Ground Surface

Elevations determined relative to top of casing of MW-1, which was arbitrarily set at 100'

Top of Casing Elevations surveyed by Griffin on 2/16/99

APPENDIX C

Water Quality Data

WATER QUALITY DATA

FARRELL / PEPSI BOTTLING
NORTH CLARENDON, VERMONT

Sample Location	**MW-1**	**Supply Well**	VGES
Sample Date:	2/16/99	2/16/99	
Analytical Method:	8021B	8021B	
PARAMETER			(ppb)
Benzene	**1.5**	ND>1	5.
Toluene	ND>1	ND>1	1,000.
Ethylbenzene	ND>1	ND>1	700.
Xylenes	**1.5**	ND>1	10,000.
Total BTEX	**3.0**	ND	-
MTBE	**71.4**	ND>10	40.
1,3,5-Trimethylbenzene	ND>1	ND>1	4.
1,2,4-Trimethylbenzene	**TBQ<1**	ND>1	5.
Naphthalene	**28.9**	ND>1	20.
Total Targeted VOCs	**103.3**	ND	-

Analytical Method:	8015-DRO	8015-DRO	
TPH (mg/L)	**0.90**	ND>0.40	

All Values Reported in ug/L (ppb), except TPH which is reported in mg/L (ppm)

ND>1 - None Detected above Detection Limit

TBQ<1 - Trace Below Quantitation Limit

Detections are bolded.

Blank cell - not analyzed

VGES - Vermont Groundwater Enforcement Standard >VGES

APPENDIX D

Analytical Laboratory Report

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Farrell Bottling/#19941469
REPORT DATE: February 18, 1999
DATE SAMPLED: February 16, 1999

ORDER ID: 1378
REF.#: 134,816 - 134,819

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Farrell Bottling/#19941469
CLIENT PROJ. #: 19941469

DATE RECEIVED: February 17, 1999
REPORT DATE: February 18, 1999
ORDER ID: 1378

Ref. #:	134,816	134,817	134,818	134,819	
Site:	Trip Blank	Supply Well	MW #1	Duplicate	
Date Sampled:	2/16/99	2/16/99	2/16/99	2/16/99	
Time Sampled:	7:12	11:25	11:50	11:50	
Sampler:	D. Tourangeau	D. Tourangeau	D. Tourangeau	D. Tourangeau	
Date Analyzed:	2/17/99	2/17/99	2/17/99	2/18/99	
UIP Count:	0	0	>10	>10	
Dil. Factor (%):	100	100	100	100	
Surr % Rec. (%):	84	90	91	94	
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	
MTBE	<10	<10	71.4	81.9	
Benzene	<1	<1	1.5	2.0	
Toluene	<1	<1	<1	<1	
Ethylbenzene	<1	<1	<1	<1	
Xylenes	<1	<1	1.5	1.5	
1,3,5 Trimethyl Benzene	<1	<1	<1	<1	
1,2,4 Trimethyl Benzene	<1	<1	TBQ <1	TBQ <1	
Naphthalene	<1	<1	28.9	28.3	

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

CLIENT: Griffin International
PROJECT: Farrell Bottling/#19941469
REPORT DATE: February 23, 1999

ORDER ID: 1378
DATE RECEIVED: February 17, 1999

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Different groups of analyses may be reported under separate cover.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits, unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

CLIENT: Griffin International
PROJECT: Farrell Bottling/#19941469
REPORT DATE: February 23, 1999

ORDER ID: 1378
DATE RECEIVED: February 17, 1999
SAMPLER: DT
ANALYST: 820

Ref. Number: 134817 | Site: Supply Well | Date Sampled: February 16, 1999 | Time: 11:25 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	< 0.4	mg/L	SW 8015B	2/19/99

Ref. Number: 134818 | Site: MW #1 | Date Sampled: February 16, 1999 | Time: 11:50 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	0.90	mg/L	SW 8015B	2/19/99

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

3 of 27

19941469

2 ORG

Project Name: FARREL/PEPSI BOTTLING Site Location: N. CLARENDON	Reporting Address: GRIFFIN	Billing Address: GRIFFIN
Endyne Project Number: 1378	Company: Contact Name/Phone #: (THIS IS WHO)	Sampler Name: DON TOURANGEAU Phone #:

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 2-16-99	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
134816	TRIP BLANK	H_2O	X		07:12	2	40mL		8021B	HCL	
134817	SUPPLY WELL				11:25	3	40mL	30'	8021B		
134818	MW #1				11:50	3	40mL	30'	8021B		
134819	DUPLICATE				11:50	3	40mL		8021B		

Relinquished by: Signature	Received by: Signature	Date/Time 2-17-99 10:25
Relinquished by: Signature	Received by: Signature	Date/Time 2-17-99 11:05

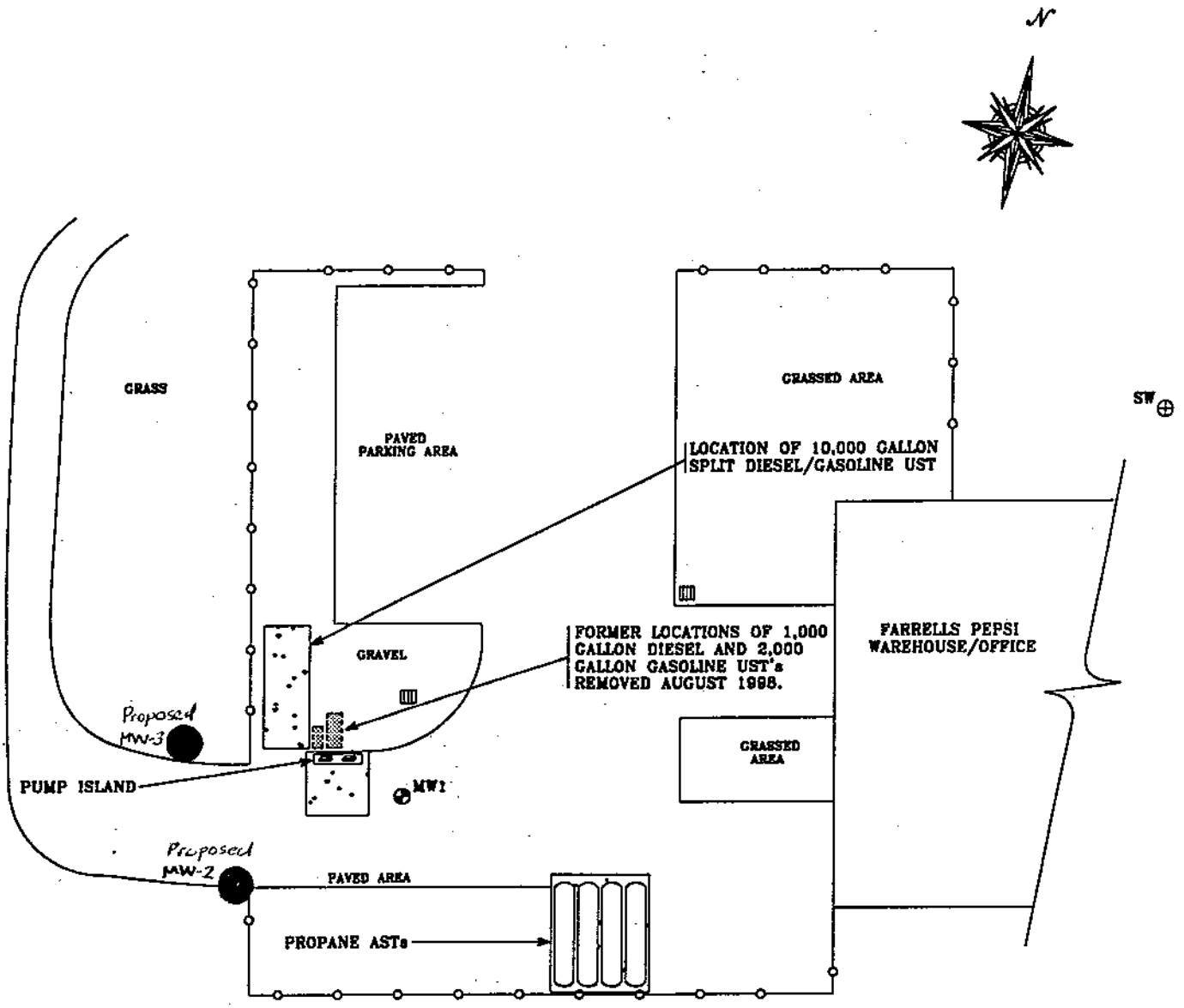
New York State Project: Yes ____ No X

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify): 8100 MODIFIED (TPH)										

APPENDIX E

Proposed Monitoring Well Locations



LEGEND

MW1	MONITORING WELL
SW	SUPPLY WELL
	STORM DRAIN
	FENCELINE

PROPOSED MONITORING WELLS

JOB #: 19941469

GRIFFIN INTERNATIONAL INC

FARRELL/PEPSI BOTTLING

PEPSI WAREHOUSE/OFFICE
NORTH CLARENDON, VERMONT

SITE MAP

DATE: 2/17/99	DWG.#:2	SCALE: 1"=40'	DRN.:SB	APP.:CW